Short Communication

A Case of Mitral Endocarditis Due to Campylobacter fetus Subsp. fetus

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SUMMARY: This report describes a patient presenting mitral native endocarditis due to Campylobacter fetus subsp. fetus, which was revealed by syncope and identified using 16S ribosomal RNA gene sequencing. This gene sequencing method has become the preferred approach to identifying the new emerging pathogens when discrepancies exist between phenotypical tests.

Campylobacter fetus subsp. fetus is a small curved motile Gram-negative rod. It is recognized as a pathogen in animals, namely cattle and sheep. Humans, especially immunocompromised patients, may present various clinical infections. The most frequent septic syndrome due to this bacterium is bacteremia (1,2). In this report, we describe the case of a patient presenting mitral native endocarditis due to C. fetus subsp. fetus revealed by syncope.

A 60-year-old man was admitted to the cardiologic ward due to unexplained syncope and a fever of 38°C. Ten years ago, he was diagnosed with diabetes mellitus type II combined with hypertensive cardiopathy and a chronic obstructive pulmonary disease (COPD) (FEV1 = 68%). On initial examination, his pulse was regular at 40/min, and his blood pressure was 150/70 mm Hg. No heart failure, palpable spleen or peripheral cutaneous endocarditis symptoms were observed. Standard electrocardiography showed signs of complete atrioventricular block that was spontaneously reversible. Blood tests demonstrated a neutrophil leucocytosis (11.8 × 10⁹/l), and the C-reactive protein (CRP) concentration was 34 mg/l (normal range <10 mg/l). One day after his admission, the patient became febrile at 39°C. Transesophageal echocardiography confirmed a large vegetation (5 × 21 mm) on the anterior leaflet of the mitral valve. Five sets of blood cultures (Bact-Alert 3D; bioMérieux, Marcy l’Etoile, France) were taken from the patient and treatment with amoxicillin (12 g/day for 6 weeks) was begun. Transesophageal echocardiography was performed again 6 days later because the patient remained febrile, and revealed an increase of the vegetation (8 × 30 mm) with a high risk of embolism. So the patient underwent valve replacement surgery showing a post-rheumatic mitral valve with a large vegetation and an oedematous ventricular septum. The pathological examination revealed a sequelar chronic endocarditis aspect without visible bacteria. None of the vegetation was sent to the pathological laboratory. DNA was extracted from a fragment of valve preserved at −80°C, as described previously (3), and it remained negative. The culture of the native valve and the vegetation were sterile. The antimicrobial treatment prescribed 10 days before might explain the negative results of the culture and the DNA destruction. Although the patient had no intestinal symptoms, the probable portal of entry was the gastrointestinal tract, as the colonoscopy showed polyps with no evidence of neoplasia, according to the histological examination of the biopsy specimens. Stools were negative for Campylobacter culture. After 3 days of incubation, three anaerobic blood culture bottles were found to be positive. According to the positive direct examination of blood culture with a curved motile Gram-negative rod, a diagnosis of endocarditis due to Campylobacteriaceae was made. Before the antibiogram was available, the patient’s therapy was modified by the addition of ciprofloxacin (500 mg × 3/day for 6 weeks). The infectious process was favorable.

This motile, non-spore-forming microaerophilic bacterium was white-grey and small (1 mm) with smooth non-hemolytic colonies after 48 h incubation on 5% blood Columbia agar at 37°C. The isolate was able to grow at 25°C. The bacterium was catalase- and oxidase-positive. Phenotypical identification performed with the Api campy strip (bioMérieux) with an inoculum at 6 McFarland confirmed the identification of Campylobacteriaceae with two choices: C. lari/C. coli (67.7% T = 0.51/19.2% T = 0.48; code no. 6421004) at 24 h and C. coli/C. fetus (88.67% T = 0.84/8.9% T = 0.68; code no. 6421114) after 48 h of incubation. Finally, the in vitro susceptibility tests, using the disk-diffusion technique on Mueller-Hinton agar with the addition of 5% horse blood, showed that this bacterium was susceptible to amoxicillin, cephalexin, cefotaxime, gentamicin, and ciprofloxacin and resistant to nalidixic acid. The susceptibility to cephalexin and the capacity of the strain to grow at 25°C were unusual for C. coli. This double phenotypical identification prompted us to use the Microseq 500 16S rDNA bacterial sequencing kit (PE Applied Biosystems, Foster City, Calif., USA). A 489-bp portion of the amplified DNA was sequenced on an automated DNA sequencer (310 ABI Prism; PE Applied Biosystems). These 489 bp were compared with the NCBI GenBank database using the BLAST algorithm, giving 100% homology with C. fetus (NCBI Blast AY621303.1) and C. fetus subsp. venerealis (NCBC Blast AY864915.1). The strain harbored by the patient was not inhibited by 1% glycine in brucella broth, suggesting that it was C. fetus subsp. fetus, and differentiating it phenotypically from C. fetus subsp. venerealis, which is inhibited by 1% glycine (4).

About 30 cases of endocarditis due to C. fetus subsp. fetus have been described in the literature. The majority of these cases involved males (70%). The valve reparation of the illness is as follows: 17 aortic valves (5-11), 6 tricuspid valves

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(9,12-15), and 6 mitral valves (16-21). In our case, the inability to accurately identify the isolate using an Api campy strip forced us to use an alternative method; as described previously, the Microseq 500 16S rDNA bacterial sequencing kit allowed us to perform the identification (22). The tropism of *C. fetus* subsp. *fetus* to the cardiovascular tissue, particularly if there is preexisting valvular damage, may be explained by the high serum resistance of *C. fetus* subsp. *fetus* due to the presence of a surface layer, a capsule-like protein that inhibits C3 binding. This property of serum resistance is probably the gastrointestinal tract (23). In the seven cases described, the patient presented an underlying general disease such as mellitus and neoplasia or a preexisting valvular lesion.

In conclusion, we report a suspicious case of mitral endocarditis due to *C. fetus* subsp. *fetus*. Careful consideration of *Campylobacter* bacteremia is important because of the risk of late cardiac complications. Moreover, accurate identification remains a challenge in clinical microbiology laboratories.

**REFERENCES**